

REMARKS

Claims 37 and 39-45 stand rejected under 35 U.S.C. § 102 (e) as being anticipated by Hanagasaki. Reconsideration is respectfully requested.

Applicant's invention is not anticipated by Hanagasaki. Hanagasaki is directed toward "sequentially etching the three layers of a pair of electrodes and a ferroelectric layer constituting the ferroelectric capacitor by using the same etching mask." (Col. 5, lines 37-43). As a result, Hanagasaki teaches that "[t]he interfaces between respective layers of the ferroelectric capacitor are not exposed during the resist film patterning process or etching process, and so the clean surface is maintained." (Col. 10, lines 47-50).

Hanagasaki addresses a completely different problem and is void of any teaching that a structure with continuous good step coverage is achieved. In fact, Applicant's invention addresses the shortcomings of Hanagasaki's structure. Applicant's invention is directed to providing a smooth, uniform, continuous film of a platinum group metal that has good step coverage.

Hanagasaki teaches a conventional method of depositing the platinum films 9 and 11. Hanagasaki teaches, "[a]s shown in FIG. 1F, successively laminated on the planarized substrate surface are a Pt film 9 by sputtering, a PZT film 10 by a sol-gel method, and a Pt film 11 by sputtering." (Col. 7, lines 48-50) (emphasis added). In the 'Discussion of Related Art' in Applicant's specification, Applicant discloses that "the conventional methods of depositing platinum films suffer drawbacks in that these methods are unable to consistently create a continuous uniformly thin platinum film that additionally has good step coverage . . . [t]hese conventional prior methods include . . . sputtering methods." (Applicant's specification, pg. 2, lines 5-11) (emphasis added).

Hanagasaki does not teach a capacitor comprising "a first and a second electrode . . . wherein at least one of said first and second electrodes comprises a uniformly thin and continuous platinum group metal having a uniform thickness of from about 50 Angstroms

to about 1000 Angstroms . . . formed in the presence of both oxygen and nitrous oxide,” as recited in claim 37 or a capacitor comprising “a first and a second electrode . . . wherein at least one of said first and second electrodes comprises a uniformly thin and continuous platinum group metal having a uniform thickness of from about 500 Angstroms to about 700 Angstroms . . . formed by depositing platinum in a CVD deposition chamber in the presence of both oxygen and nitrous oxide at a predetermined temperature and at a pressure of from about 10 to about 1000 Torr,” as recited in claim 41.

Accordingly, Hanagasaki does not teach Applicant’s structure since Hanagasaki teaches a conventional way of depositing a platinum film. The Office Action asserts that “as sown [sic] in Hanagasaki’s Fig. 1H, the lower and upper electrodes are uniformly thin and continuous.” (Office Action, pg. 2). There is no support for this assertion. Hanagasaki teaches a conventional method of depositing platinum films 9 and 11. Hanagasaki does not teach anywhere that the platinum films are uniformly thin and continuous. Hanagasaki simply does not teach deposition of a “platinum group metal . . . in the presence of both oxygen and nitrous oxide,” as recited in claims 37 and 41.

The Office Action further asserts that the limitations found in claims 37, 41, 42 and 43 are “taken to be a product by process limitation.” (Office Action, pg. 3). Applicant’s structure is not identical nor only slightly different from Hanagasaki’s structure. Applicant’s structure is completely different from conventionally deposited platinum films, as taught in Hanagasaki, as a result of the particular deposition process utilized. Applicant’s specification provides further proof of the structural differences.

Applicant’s FIG. 2 illustrates a metal film formed in accordance with the invention (in the presence of oxygen and nitrous oxide); whereas, Applicant’s FIG. 3 illustrates a metal film formed by conventional methods such as taught in Hanagasaki. As illustrated, the metal film of FIG. 3 is not smooth and continuous compared with the metal film in FIG. 2. Instead, it is rough and not continuous. As a result of depositing a metal film in the presence of both oxygen and nitrous oxide, Applicant’s structure is clearly different since the metal film has good step coverage and is smooth and continuous.

“The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product.” M.P.E.P. § 2113 (emphasis added).

Applicant teaches that the presence of nitrous oxide is believed to modulate the growth of the metal film since “nitrous oxide is a weaker oxidizing agent than the oxygen and the combination of these two oxidizing gases modulates the growth of the platinum group metal film while reducing the carbon content in the film.” (Applicant’s specification, pg. 14, lines 19-29) (emphasis added). As a result, claims 37, 41, 42 and 43 recite structural limitations of the metal film (which are clearly illustrated in FIG. 2) resulting from particular deposition parameters, and which cannot be adequately described in any other manner.

Claims 37 and 39-45 recite limitations which distinctly claim the product for which protection is sought: a capacitor with a smooth and continuous platinum electrode comprising a platinum group metal formed as a result of a particular deposition process, “in the presence of both oxygen and nitrous oxide” and under predetermined specific temperature, pressure and combined flow rate ranges. Claims 37 and 39-45 recite structural limitations (which are clearly illustrated in FIG. 2) resulting from particular deposition parameters, and which cannot be adequately described in any other manner.

Claims 39-40 depend from claim 37 and claims 42-45 depend from claim 41, and are allowable for at least those reasons described above.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

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Respectfully submitted,

By 

Thomas J. D'Amico

Registration No.: 28,371

DICKSTEIN SHAPIRO MORIN &

OSHINSKY LLP

2101 L Street NW

Washington, DC 20037-1526

(202) 785-9700

Attorney for Applicant